

Patient 66 Answers

1 The patient was known to be in good health with no evidence of diabetes before he fractured his femur. It is known that patients, particularly older people, frequently have glucose intolerance in response to trauma. The mechanism of this has not been fully elucidated but is likely to be due, at least in part, to high levels of cortisol in the post-trauma phase. The hypercortisolaemia tends to persist longer in older people when compared with the young. Of course, it is possible that the patient already had undiagnosed diabetes mellitus and he would certainly need further investigation.

2 E Trauma.

The most likely reason for the high total white cell count and moderate rise in ESR is trauma. The mechanism for the high white cell count is probably mainly post-trauma hypercortisolaemia, though that would not explain the high ESR. Patients with large fractures often have a mild to moderate rise in ESR, partly due to the release of acute-phase proteins such as fibrinogen and CRP in response to injury, and possibly also partly due to activation of inflammatory pathways. Both would be expected to fall during the recovery phase, though the hypercortisolaemia can persist for several weeks in some individuals. There is no evidence of sepsis in this case and no reason to suspect myeloma as the ESR and full blood count have been shown to be normal only a few weeks before the injury. Old age would not in itself account for the findings.

Patient 67 Answers

1 E Mesothelioma.

The radiograph shows a large pleural effusion on the right side. In addition, there is pleural calcification above the left diaphragm and pleural thickening along the left hemi thorax. These radiological findings coupled with the history of being a dockyard worker (risk of exposure to asbestos) make mesothelioma the most likely cause of the abnormalities.

3 The glucose intolerance in such a patient might be transient, particularly if it is solely due to the high cortisol levels prevailing after the injury. In such a case it might not be necessary to start any specific treatment, other than to monitor the blood glucose levels until they return to normal. If very high levels occur, the patient will need temporary management with small doses of insulin or an oral antihyperglycaemic agent. If the glucose intolerance persists, and particularly if the cortisol levels have been shown to have returned to normal, the patient is likely to require longer-term management of a diabetic state. The choice of therapy depends on the pattern of the illness, the patient's weight and lifestyle, and other co-morbidities.

4 A patient with a long plate for a mid femoral shaft fracture will be relatively immobile for 3–4 weeks, though partial weight-bearing can be started relatively early. There is a substantial risk of DVT for which mechanical prophylaxis with graduated compression stockings would be sensible. Patients who are more immobile require thromboprophylaxis with low-molecular weight heparin, once perioperative haemostasis has been achieved. The most important long-term prophylactic measure in this patient would be to give a bisphosphonate, calcium, and vitamin D to try to improve tensile bone strength. The patient's fracture occurred after a relatively low energy impact (short fall onto a grassy surface) so he is very likely to be osteoporotic.

2 D Aspirate the pleural fluid.

This patient presents with severe shortness of breath. The most immediate aim of management would be symptom relief, and aspiration of the pleural fluid is a priority. There is no evidence of heart failure or pneumonia in this patient, therefore diuretics or antibiotics will not offer significant symptom relief. The process of obtaining a histological diagnosis can wait until the patient is symptomatically better.

67b Chest radiograph showing pleural plaques.



67c Consequences of asbestos exposure. 1, pleural thickening; 2, pleural effusion; 3, pleural calcification.

Tutorial (Patient 67)

It is generally accepted that mesothelioma is almost always associated with asbestos exposure. Blue asbestos is the usual causative agent. The illness often develops 20–40 years after exposure. Apart from mesothelioma, asbestos may also cause pulmonary fibrosis, squamous carcinoma of the lung, and pleural plaques (67b, 67c). Plaques are indicative of exposure and are not in themselves premalignant, although patients who have plaques are more likely to develop other asbestos related illnesses. This may generate anxiety and this has been recognized in a recent court ruling as an adverse outcome of asbestos exposure. Patients may be entitled to compensation for the presence of plaques.

Patient 68

A 73-year-old man presented with an inability to walk. He complained of right foot pain (68). He denied any trauma. He had a past history of hypertension and was taking aspirin 75 mg daily, frusemide 40 mg daily, and amlodipine 5 mg daily, and had started taking allopurinol for hand tophi and hyperuricaemia 2 weeks ago. He was on no other medication.



68 Painful right foot.

- 1 What is the most likely reason for the onset of his symptoms?
- A Cellulitis.
 - B Deep vein thrombosis.
 - C Allopurinol therapy.
 - D Aspirin sensitivity.
 - E Metatarsal stress fracture.

- 2 What test would be most useful to help confirm the diagnosis?
- A Serum uric acid.
 - B Polarized microscopy of joint fluid.
 - C Radiograph of the foot.
 - D Sono-venogram of the foot.
 - E Urinalysis and microscopy.

Patient 68 Answers

1 C Allopurinol therapy.

The appearance of the foot with erythema around the metatarso-phalangeal joint of the big toe suggests acute gout. This is a well-known complication after starting allopurinol therapy. Prophylaxis is needed when commencing allopurinol and this needs to be continued for some months, even after serum urate levels have returned to normal. NSAIDs are usually given for prophylaxis though colchicine is sometimes preferred for this purpose, being cheaper and well tolerated, especially in patients with peptic ulcer, GI bleeding or dyspepsia, or who are taking anticoagulants.

Tutorial

First attacks of gout commonly occur in men aged 30–60 years. At first presentation it affects the metatarso-phalangeal joint of the big toe, a condition known as podagra; in most cases, though other peripheral joints can be affected. It rarely occurs in the axial skeleton or large joints such as the hip or shoulder (and almost never as the first site). It can also present as tenosynovitis, bursitis, or cellulitis. The initial attack can be sudden, waking the patient from sleep. The affected joint becomes red, hot and swollen, with shiny skin. It is very tender and painful. Attacks may be accompanied by fever, leukocytosis and raised erythrocyte sedimentation rate, and preceded by prodromal symptoms. Untreated attacks last days to weeks and are self-limiting. The later stages of gout are described on page 120. *Table 68* presents the risk factors for gout.

2 B Polarized microscopy of joint fluid.

The history is important and can lead to a working diagnosis in many cases. Gout usually presents in one joint at a time, while other arthritic conditions, such as systemic lupus and RA, usually involve multiple joints simultaneously. Blood tests may support the diagnosis by showing high urate levels, but these levels are also sometimes elevated in the absence of gout, and in this patient hyperuricaemia had already been confirmed. In addition, the uric acid in the blood may be normal in some cases of acute gout. The diagnosis is made if negatively birefringent needle-shaped urate crystals are seen in the joint aspirate when examined under polarized light by microscope. A radiograph of the foot is not likely to show abnormalities apart from soft tissue swelling in early cases of gout. A sono-venogram is not indicated in this case.

Table 68 Risk factors and triggers for gout

Risk factors

- Genetic predisposition for an abnormality in handling urate accounts for approximately half of all cases. A family history of gout can be a risk factor
- Men of middle age
- High BP
- Drugs:
 - Cytotoxics
 - Thiazides
 - Frusemide
 - Ethambutol
 - Salicylates in low dosage
 - Pyrazinamide
 - Sulphonamides
- Obesity or excessive weight gain, especially in youth
- Moderate to heavy alcohol intake
- Abnormal renal function
- Western lifestyle
- Underlying diseases with a high turnover of cells (malignancy, especially blood neoplasms, and haemolytic anaemia)

Triggers

- Recent surgery
- Dehydration
- Joint injury
- Excessive dining
- Heavy alcohol intake (particularly beer, that has a high purine content)
- Stress
- Change in diet
- Certain high purine foods such as red meat and shellfish

Patient 69

An 86-year-old woman who lived alone was admitted after being found collapsed by neighbours. She denied alcohol abuse. She had a BMI of 23 kg/m². She had spontaneous bleeding from the gums, which were also noted to be of abnormal appearance (69a). She also had extensive bruising of the legs (69b) but the rest of the physical examination was normal.

Her basic liver function tests were normal. Vitamin K corrected the INR but the bleeding persisted and her haemoglobin dropped to 6.5 g/dL. A gastroscopy and colonoscopy were normal.

Investigations (normal range)

Haemoglobin 8.9 g/dL (11.5–16.5)
 Total white cell count $4.5 \times 10^9/L$ (4–11)
 Platelet count $150 \times 10^9/L$ (150–400)
 Serum folate 0.8 $\mu\text{m}/L$ (1.7–13.0)
 Red cell folate 85 $\mu\text{m}/L$ (85–500)
 Plasma fibrinogen 2.5 g/L (1.5–4.0)
 Thrombin time 13 s (12–16)
 INR 1.9
 APTT 27 s (26–40)

1 What is the most likely cause of the bleeding?

- A Alcoholic liver cirrhosis.
- B Myelodysplasia.
- C Folate deficiency.
- D Scurvy.
- E Disseminated intravascular coagulation.

Patient 70

A 91-year-old man was found to be dehydrated after spending 2 days on the floor of his flat. He was agitated and it proved difficult to maintain an intravenous line. A decision was made to give subcutaneous fluids.



69a The patient's gums at initial examination.

69b The appearance of the legs.



1 Which of these fluids can be safely administered subcutaneously?

- A Hartman's solution.
- B 10% dextrose.
- C 0.9% saline.
- D Fresh frozen plasma.
- E Sterile water.

Patient 69 Answer

1 D Scurvy.

The spontaneous bleeding offers a wide differential diagnosis. Despite a normal BMI this woman showed evidence of multiple vitamin deficiencies. The bleeding persisted after correction of her INR with vitamin K. In the presence of normal platelets and a normal oesophagogastro-duodenoscopy and colonoscopy, an acquired vascular abnormality is likely. Scurvy is the most likely diagnosis in this case. The gums show gingival hyperplasia. Folic acid deficiency can occur in scurvy due to lack of protection of folate co-enzymes that maintain body folate in the reduced active state. There is no evidence to support a diagnosis of alcoholic liver cirrhosis, myelodysplasia, or disseminated intravascular coagulation; in the last a low platelet count and fibrinogen level would be expected.

Patient 70 Answer

1 C 0.9% saline.

Approximately 3 L of fluid can be given subcutaneously in a 24-hour period at two separate sites. Common infusion sites are the chest, abdomen, thighs, and upper arms. The preferred solution is normal saline, but other solutions, such as half-normal saline, glucose with saline, or 5% glucose, can also be used. Concern has been expressed that the rapid subcutaneous infusion of electrolyte-free solution can cause hypotension. Shock has been reported with the subcutaneous infusion of 5% dextrose in children and 10% dextrose in adults. Several authors have, however, reported the safe administration of 5% dextrose subcutaneously and careful administration of small amounts is safe. This is important as hypertonic dehydration is common in the elderly. Potassium chloride has also been added to the solution bag when

Tutorial

The human body is unable to synthesise vitamin C and a diet deficient in vitamin C results in scurvy. Adult scurvy is common in elderly people living alone who prepare their own food or who have particular food fads. Alcoholism, smoking, acute illness, and GI disease all predispose to scurvy.

Vitamin C is a co-factor in the synthesis of collagen and deficiency leads to the breakdown of connective tissue in and around blood vessels and other structures. This leads to manifestations such as the corkscrew appearance of hair follicles and spontaneous bleeding. Scurvy can mimic disorders such as vasculitis, systemic bleeding disorders, and deep vein thrombosis. Typically, vitamin C deficiency is not isolated and other nutritional deficiencies should be sought.

Vitamin C deficiency is diagnosed by the Vitamin C Saturation Test or by measuring leukocyte or serum ascorbic acid levels. Plasma vitamin C is nearly always undetectable in patients with overt scurvy but the range in healthy subjects is too variable for it to be of diagnostic value. Probably the best test to make the diagnosis is still the Vitamin C Saturation Test as it has been shown that leukocyte vitamin C levels may not identify all patients. Prognosis is excellent and clinical improvement is usually apparent soon after starting vitamin C supplements.

needed. There are reports that this may lead to subcutaneous inflammation. In view of such conflicting information some local policies may preclude giving 5% dextrose or potassium chloride subcutaneously. It is important therefore to check with local guidelines before administering such fluids. Hyaluronidase can also be added to enhance fluid absorption. This is useful when one wishes to administer a relatively large volume of fluid at a single site.

Fluids can be given as a continuous infusion throughout a 24-hour period, as an overnight infusion, or a rapid intermittent infusion of up to 500 ml of fluid over 20 minutes. In general, however, no more than 3 L should be administered over a 24-hour period. It may be difficult to give more than 1.5 L at a single site. Because of the risk of hypotension, no more than 2 L of 5% dextrose should be administered subcutaneously over 24 hours with a maximum of 2 ml/minute at any one time.

Patient 71

A 75-year-old patient with general joint pains was noted to have the rash shown in Figure 71.

- 1 What is this rash?
- Livedo reticularis.
 - Cutis marmorata.
 - Erythema ab igne.
 - Erythema nodosum.
 - Erythema marginatum.



71 The patient's foot, showing skin rash.

Patient 72

A 67-year-old man presented with a dry cough and a 2-year history of shortness of breath and weight loss. Physical examination revealed hard lumps around his fingers. He looked cyanosed and his PaO₂ was 7.5 kPa (11.3–12.6). He had normal spirometry.

A plain radiograph of his hands is shown in Figure 72.

- 1 What is the most likely cause of this patient's cyanosis?
- Pneumonia.
 - Pulmonary fibrosis.
 - Pulmonary vascular disease.
 - Adult-onset asthma.
 - COPD.



72 Plain radiograph of the hands.

Patient 71 Answer

1 A Livedo reticularis.

The rash is livedo reticularis. Livedo reticularis refers to a condition in which dilatation of capillary blood vessels and stagnation of blood within them causes a mottled discolouration of the skin. It is described as being a reticular (net-like), cyanotic (reddish blue), cutaneous discolouration surrounding pale central areas. It occurs mostly on the legs, arms, and trunk and is more pronounced in cold weather. *Table 71* presents the causes.

Cutis marmorata causes temporary livedo in about 50% of normal infants and many children and adults when exposed to the cold and is a physiological response. Erythema ab igne is a reticular pigmented rash that develops after chronically exposing a part of the body to a hot or warm object, such as a hot water bottle. Erythema nodosum consists of red tender raised areas of skin mostly on the extensor surfaces of the legs and arms. Erythema marginatum consists of pink coalescing rings usually on the trunk that come and go.

Patient 72 Answer

1 C Pulmonary vascular disease.

The most likely cause for his symptoms and cyanosis is pulmonary vascular disease associated with systemic sclerosis. The normal spirometry makes pulmonary fibrosis

Table 71 Causes of livedo reticularis

Idiopathic

Mostly in young and middle aged females, particularly during winter; occurs on exposure to cold

Secondary causes:

Vasculitis

- Livedoid vasculitis
- Polyarteritis nodosa
- SLE
- Dermatomyositis
- RA
- Lymphoma
- Pancreatitis
- TB

Obstruction

- Cryoglobulinaemia (immunoglobulins that precipitate in the cold)
- Antiphospholipid syndrome or lupus anticoagulant syndrome
- Hypercalcaemia
- Polycythaemia rubra vera (excessive number of red cells) or thrombocythaemia (platelet clumps)
- Infections (syphilis, TB)
- Arteriosclerosis (cholesterol emboli) and homocystinuria
- Intra-arterial injection in drug addicts

much less likely. Age at the onset of scleroderma is an important risk factor for PAH. There is a twofold greater risk of PAH for late-onset (age > 60 years) versus earlier-onset (<60 years) disease. Vigilance of these high-risk patients may provide an opportunity to intervene prior to development of irreversible pulmonary vascular disease.

Tutorial

Scleroderma is an unusual form of connective tissue disorder, literally translated as 'hardening of the skin'. There are two major forms, systemic and localized. Systemic forms of scleroderma occur in two patterns – diffuse systemic sclerosis and limited systemic sclerosis. The former consists of scleroderma with more generalized skin involvement as well as involvement of other systems, particularly the oesophagus, joints, intestines, lungs, heart, and kidneys. It varies greatly in severity and in the rate of progression of the disease. It can range from the widespread thickening of skin (diffuse) to a form with more limited skin involvement (CREST).

CREST is an acronym made up of the first letters of the five most prominent manifestations of this form of scleroderma:

- Calcinosis (due to deposition of calcium salts under the skin)
- Raynaud's phenomenon
- (O)esophageal dysfunction (the loss of normal action in the lower oesophagus)
- Sclerodactyly (hardening of the skin on the digits)
- Telangiectasia

The localized forms of scleroderma include morphea, a localized scleroderma which begins with an inflammatory stage followed by the appearance of one or more patches or plaques, and linear scleroderma, which is a band of thickening of the skin often limited to one area.

Patient 73

A 70-year-old patient with sero-positive RA presented unable to walk. Physical examination revealed grade 3/5 weakness of dorsiflexion of the right foot. The plantar reflex was equivocal.

- 1 Which of the following statements best applies to this case presentation?
- A This may be due to mononeuritis.
 - B Rheumatoid factor is undetectable in the patient's serum.
 - C Peripheral neuropathy would present with bilateral foot drop.
 - D Ischaemic stroke can be safely excluded.
 - E Magnetic resonance imaging of the cervical spine is not indicated.

Patient 74

A 70-year-old man presented to the Day Hospital because of increasing difficulty with using his hands. He had a long-standing history of hand pain. Physical examination revealed markedly abnormal hands (74).

- 1 What is the diagnosis?
- A RA.
 - B Arthritis mutilans.
 - C Erosive OA.
 - D Chronic tophaceous gout.
 - E Psoriatic arthropathy.



74 Painful abnormal hands.

Patient 75

An 84-year-old man who lived alone was referred with poor mobility. Physical examination revealed a rather unkempt man with severe onychogryphosis.

- 1 Who was the best person to deal with this condition?
- A Reflexologist.
 - B Geriatrician.
 - C Nurse specialist.
 - D Physiotherapist.
 - E Chiropodist.